

**Antimicrobial Activity of Different Extracts of  
*Geodorum densiflorum* (Lam) Schltr. pseudobulb**\*Saleha Akter<sup>1</sup>, Mohammad Zafar Imam<sup>2</sup> and Tahira Akter<sup>1</sup><sup>1</sup>Department of Pharmacy, Primeasia University, Banani, Dhaka<sup>2</sup>Department of Pharmacy, Stamford University Bangladesh  
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*Geodorum densiflorum* (Lam) Schltr., locally known as Shonkhomul, (Family: Orchidaceae) is a medium sized terrestrial herb with buried or half buried, spherical pseudobulbs, 3-5 leaves, white to deep flowers that blooms in the spring. It is widely distributed in India, Nepal, Bhutan, Papua New Guinea, Australia, Bangladesh, Sri Lanka and Chinese Himalayas. It's an endangered species (Sheelavantmath et al., 2000). The pseudobulb is used to regularize menstrual cycle (Dash et al., 2008) and in diabetes by the traditional practitioners. The underground pseudobulb of the plant has been found to possess anti-diabetic property (Roy and Banerjee, 2002).

The pseudobulb of *Geodorum densiflorum* (Lam) Schltr. was collected from a local market of Dhaka, Bangladesh in February 2010. A voucher specimen of the plant has been deposited in Bangladesh National Herbarium, Dhaka. The collected pseudobulb was first washed and then sliced and dried under shade for 15 days and then grinding was performed to make coarse powder weighing about 500gm. Then 150gm of powder was taken in each of the three different containers and were soaked with sufficient amount of water, methanol and petroleum ether consecutively for 7 days with occasional shaking and stirring. The solvents were then filtered off and the filtrates were dried in reduced temperature (<40 °C) in a rotary evaporator to get the final extracts namely water extract, methanol extract and petroleum ether extract.

The antimicrobial activity of the extracts was determined by the disc diffusion method described by Bauer et al. (1966). The test samples of water, methanol and petroleum ether extracts were prepared by dissolving 50 mg each of the dried water, methanol and petroleum ether extracts respectively in 2 ml of respective solvent to get a concentration of 25µg/µl. To prepare sample discs, sterilized filter paper discs (5 mm diameter) were taken and 16µl of sample solution was applied aseptically with the help of a micropipette to each filter paper disc to deliver an amount of 400µg/disc. Kanamycin (30µg/disc) was used as positive control to compare the antibacterial activity of the test material. Blank discs of water, methanol and petroleum ether were prepared by using equal volumes of the solvents without extracts. The plates were then placed in a refrigerator for about 24 h at 4°C to allow sufficient time for the material to diffuse to a considerable area of the medium. Finally, the plates were incubated at 35±2°C for 24h. After incubation, the antibacterial activity of the test agent was determined by measuring the diameter of inhibitory zones. The assay was performed in duplicate and the zone of inhibition was expressed as mean in mm. Five gram-positive and eight gram-negative bacteria and three fungi were used here as test microorganism.

The results of antimicrobial screening of the extracts revealed that (Table 1) the methanolic extract possesses better antimicrobial activity than petroleum ether and water extract against almost all the test bacteria and fungi and showed zone of inhibition of 11-16mm. The petroleum ether extract showed moderate activity and the water extract showed insignificant activity against the microorganisms.

**Table 1: Antimicrobial activity of different extracts of *Geodorum densiflorum*.**

Test microorganisms	Diameter of Zone of Inhibition (mm)			
	GDW (400µg/disc)	GDM (400µg/disc)	GDPE (400µg/disc)	Kanamycin (30µg/disc)
<b>Gram-positive bacteria</b>				
<i>Bacillus cereus</i>	8	13	10	31
<i>Bacillus megaterium</i>	-	12	9	32
<i>Bacillus subtilis</i>	-	14	8	30
<i>Staphylococcus aureus</i>	8	15	9	30
<i>Sarcina lutea</i>	-	15	10	28
<b>Gram-negative bacteria</b>				
<i>Salmonella paratyphi</i>	7	13	9	29
<i>Salmonella typhi</i>	9	14	10	27
<i>Vibrio parahaemolyticus</i>	-	11	7	30
<i>Vibrio minicus</i>	-	12	8	31
<i>Escherichia coli</i>	8	15	9	32
<i>Shigella dysenteriae</i>	-	14	10	30
<i>Pseudomonas aureus</i>	-	13	7	30
<i>Shigella boydii</i>	-	14	11	28
<b>Fungi</b>				
<i>Saccharomyces cerevaceae</i>	-	16	12	31
<i>Candida albicans</i>	-	16	10	32
<i>Aspergillus niger</i>	-	15	12	34

(-) sign means zero inhibition. GDW: Water extract of *G. densiflorum*; GDM: Methanolic extract of *G. densiflorum*; GDPE: Petroleum ether extract of *G. densiflorum*; Kanamycin: Standard antibiotic.

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